



Blackleg: A Disease of Canola

FarmFacts

Produced by Saskatchewan Agriculture and Food and Saskatchewan Rural Development

Blackleg is a serious disease of canola that causes significant yield losses. It is caused by the fungus *Leptosphaeria maculans*. A highly virulent strain of blackleg was first detected in Saskatchewan in 1975, and has since become widespread throughout the canola growing areas of the province. A 1996 Saskatchewan Agriculture survey found blackleg in 65% of fields surveyed. A similar survey in 1989 found 90% of fields infested, with an average of 52% of plants infected per field. Yield losses vary, but have approached 100% in some cases.

If you have blackleg on your farm, control measures are required. If you don't have blackleg, careful seed treatment and weed control will be required to prevent the disease from becoming established.

Symptoms of Blackleg

Blackleg infections may occur on cotyledons, leaves, stems and pods. Leaf spots are dirty white in colour, round to irregular in shape and are usually dotted with numerous small, black pycnidia (spore bearing structures). Pycnidia appear as tiny round specks (pepper spots) on affected parts, and may be seen more easily with the aid of a hand lens. On stems, blackleg lesions can be quite variable, but are usually found at the base of the stem or at points of leaf attachment. Stem lesions may be up to several inches in length, and are usually white or gray with a dark border. Numerous pycnidia form in the center of the lesion.

Stem lesions may also appear as a general blackening at the base, again with numerous pycnidia. Severe infection usually results in a dry rot or canker at the base of the stem. The stem becomes girdled and the plant ripens prematurely and may lodge. Seed may be shrivelled and pods may shatter easily resulting in seed loss.

Spread of Blackleg

Long distance airborne spores

The fungus survives on residue from infected crops, forming ascospore-bearing structures the following season. Ascospores are discharged and become airborne. They can travel great distances. The virulent strain may begin ascospore production in May or June, causing leaf lesions from the seedling stage onward. Ascospore production can continue for two or three years, or more until the

stubble breaks down. All the while, Blackleg can infect susceptible plants from the airborne spores.

Short distance spores (conidiospores)

New infections produce fruiting structures (pycnidia), which ooze out masses of tiny, infectious summer spores, or conidiospores. These spores are spread short distances by rain splash and cause localized infection within a crop. Warm, dry conditions slow the spread of the disease.

Seed borne mycelium

The virulent strain of Blackleg is seed-borne, so treatment of seed is essential to keep the disease from clean areas.

Life Cycle (see illustration)

1. Seedling infection may arise from infected seed or from airborne spores. Plants infected at this stage may be lost or stunted. Seed treatment will protect plants from infected seed but will not protect seedlings from infection by airborne spores.
2. Infection before the 6-leaf stage is usually associated with serious yield loss. By mid-July plants may start to fall over as the fungus girdles stem bases, often completely severing or cutting off the plant.

Short distance spores (conidiospores) from leafspots which are



spread by rain splash, cause localized infection in the crop.

3. Infections initiated beyond the 6 leaf stage cause less damage than infections at stage #1 or #2.

It is suspected that stem lesions are initiated internally from mycelium which has spread systemically down the petiole from a leaf infection. Wounded stems may be infected directly.

4. Infection of the pods will cause infected seed and therefore will be a source of future infestation.
5. Seedborne disease can be spread great distances.
6. Infected stubble can produce airborne spores until it is decomposed (4 or 5 years) or buried.

Control Measures

Locate and Identify the Disease

Locate diseased plants and confirm

the type of disease (samples to Department of Agriculture and Food Crop Protection Laboratory).

Information on the location of disease is important when planning your cropping program. The disease spores are spread by wind from crop residue.

Rotate Crops

A long crop rotation remains the most important control measure for blackleg. Canola should not be seeded on or adjacent to canola stubble or in fields that had infected plants during the previous 4 years. A long rotation is also advisable to control Sclerotinia stem rot.

Control of Weeds

Wild mustard and volunteer canola in your crop rotation will maintain the disease from year to year. Good weed control in the non-canola years will help to break the disease cycle.

Seed Treatment

A known seed source and fungicide seed treatment is the best defence against the introduction of blackleg to your farm. Seed treatment will not protect plants from wind-blown spores.

Crop Residue

Blackleg infested canola stubble should be buried by plowing or deep cultivating. This will minimize spore production and hasten decomposition.

Resistance

Plant breeders are making progress in the development of blackleg resistant varieties. Canola varieties with partial resistance to blackleg include Legend, Profit, Hyola 40, Vanguard, Celebra and Delta. Varieties with even better resistance may be available in the future.

For more information contact your extension agrologist.

Blackleg Disease Cycle

